A REVIEW AND ANALYSIS OF THE ON-GOING IMPLEMENTATION OF BUDGET AUTOMATION AT CINCLANTFLT

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Monterey, California

THESIS

A REVIEW AND ANALYSIS OF THE
ON-GOING IMPLEMENTATION OF
BUDGET AUTOMATION AT CINCLANTFLT

by

Christopher Douglas Huber

December 1978

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by

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ABSTRACT

The Commander In Chief, U.S. Atlantic Fleet (CINCLANTFLT) was tasked with developing a prototype system for the automation of field budget data so that it could be rolled up at the Major Claimant level for use as an input to the automated Major Claimant budget submission. Perhaps the most important phase of this program was the development of an integrated Financial Management Information System (FMIS). This project was designed to automate substantial portions of budget formulation, presentation and justification for an annual budget of approximately 2.5 billion dollars. This thesis is a concentrated study and analysis of FMIS development at CINCLANTFLT. Analyses conducted included a review of current manual budget procedures at CINCLANTFLT, presentation of a theoretical FMIS model, and a detailed study of design and implementation of each phase of FMIS. Comparisons and conclusions are made between the model and actual FMIS implementation. Some general recommendations are submitted for consideration.

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LIST OF ABBREVIATIONS

ADP	Automated Data Processing
CAM	Claimant Accounting Module
CINCLANTFLT	Commander in Chief, U.S. Atlantic Fleet
CINCPACFLT	Commander in Chief, U.S. Pacific Fleet
CINCUSNAVEUR	Commander in Chief, U.S. Naval Forces, Europe
CNO	Chief of Naval Operations
CRT	Cathode Ray Tube
DOD	Department of Defense
DONPIC	Department of Navy Planning and Information Center
FAADCLANT	Fleet Accounting and Disbursing Center Atlantic
FMIS	Financial Management Information System
FY	Fiscal Year
FYDP	Five Year Defense Program
IDA	Integrated Disbursing and Accounting
JSOP	Joint Strategic Objectives Plan
MSC	Military Sealift Command
NAFC	Navy Accounting and Finance Center
NARDAC	Regional Naval Data Automation Command
NARM	Navy Resource Model
NAVCOMPT	Comptroller of the Navy
NCIS	Naval Cost Information System
O & MN	Operation and Maintenance, Navy
OP-92	Director Navy Financial Management
OPNAV	Office of the Chief of Naval Operations

POM	Program Objective Memorandum
PPBS	Planning, Programming and Budgeting System
RA/TA	Restricted/Tender Availability
ROH	Regular Overhaul
ROV	Repair of Other Vessels
SHOROC	Shore Required Operational Capability
SMIS	Ships Management Information System
TAD	Temporary Additional Duty
TTY	Teletype
WWDMS	World Wide Data Management System
WWMCCS	World-Wide Military Command and Control System
ZBB	Zero Base Budgeting

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I. INTRODUCTION

A. BUDGET PROCESS OVERVIEW

As the allocation of limited resources becomes more complex, the necessity for a viable, time sensitive resource management system becomes more critical. In this environment it is essential to improve the analytical tools and techniques used to produce information for accurate and timely decision making. One area of resource management that has undergone significant changes in scope and complexity within the last decade is the budgeting and accounting system of the Department of Defense.

Many resources are limited, but the major resource that is critically strained in the present manual system of Department of Defense (DOD) budget preparation is manpower. Unfortunately, in the near future it appears there will not be enough people in the system to meet all the requirements of the DOD and Navy budget process. As the Defense budget has grown in dollars, more and more reports and requirements have been levied at all levels of the budget submission process. Many of these requirements are justifications and exhibits showing how each Defense dollar is budgeted. With the addition of the new Zero-Base Budgeting (ZBB) requirements the entire process has become almost unworkable. In many cases, the people directly involved in budget preparation spend a great number of overtime hours manipulating numbers

and rewriting budget submission formats simply to satisfy a never ending stream of new requirements levied by external, higher authorities. Without a flexible budgeting system, which will permit exhaustive evaluation of alternatives, the Defense budget may soon be mired in meaningless shufflings of paperwork. One solution currently being introduced to cope with this problem is the automation of the budget process. If a computer can take over many of the menial tasks that are now done manually, it is postulated that there will be additional time available for assigned personnel to study and analyze the Defense budget and to generate more meaningful responses to declining resources.

The Defense budget process is a long, involved evolution. One budget cycle extends for approximately two to three years, beginning with the formation of the Joint Strategic Objectives Plan (JSOP I) and ending with a signed Defense Appropriation act. There are many players in the budget process that contribute to the preparation of the Defense budget. One of the primary contributors is the Major Claimant. In the DOD budgeting arena, there are 14 Major Claimants (listed in Figure 1) responsible to the Chief of Naval Operations (CNO) for financial matters. They interface with OP-92, the code within the CNO's office with responsibility for all Navy appropriations. Figure 2 illustrates this chain of functional responsibility.

The Major Claimant receives budget guidance from OP-92, and then, with specific guidance constraints, passes his

LIST OF FOURTEEN MAJOR CLAIMANTS

COMMANDER-IN-CHIEF U.S. ATLANTIC FLEET	(CINCLANTFLT)
COMMANDER-IN-CHIEF U.S. PACIFIC FLEET	(CINCPACFLT)
COMMANDER-IN-CHIEF U.S. NAVAL FORCES EUROPE	(CINCUSNAVEUR)
CHIEF OF NAVAL EDUCATION & TRAINING COMMAND	(CNET)
CHIEF OF NAVAL RESERVE	(CNR)
CHIEF OF NAVAL MATERIAL	(CNM)
CHIEF OF NAVAL PERSONNEL	(CNP)
BUREAU OF MEDICINE	(BUMED)
COMMANDER NAVAL TELECOMMUNICATIONS COMMAND	(COMNAVTELCOM)
COMMANDER NAVAL INTELLIGENCE COMMAND	(COMNAVINTCOM)
COMMANDER NAVAL SECURITY GROUP	(COMNAVSECGRU)
CHIEF OF NAVAL OPERATIONS	(CNO)
COMPTROLLER OF THE NAVY	(NAVCOMPT)
NAVAL OCEANAGRAPHIC COMMAND	(OCEANCOM)

Figure 1

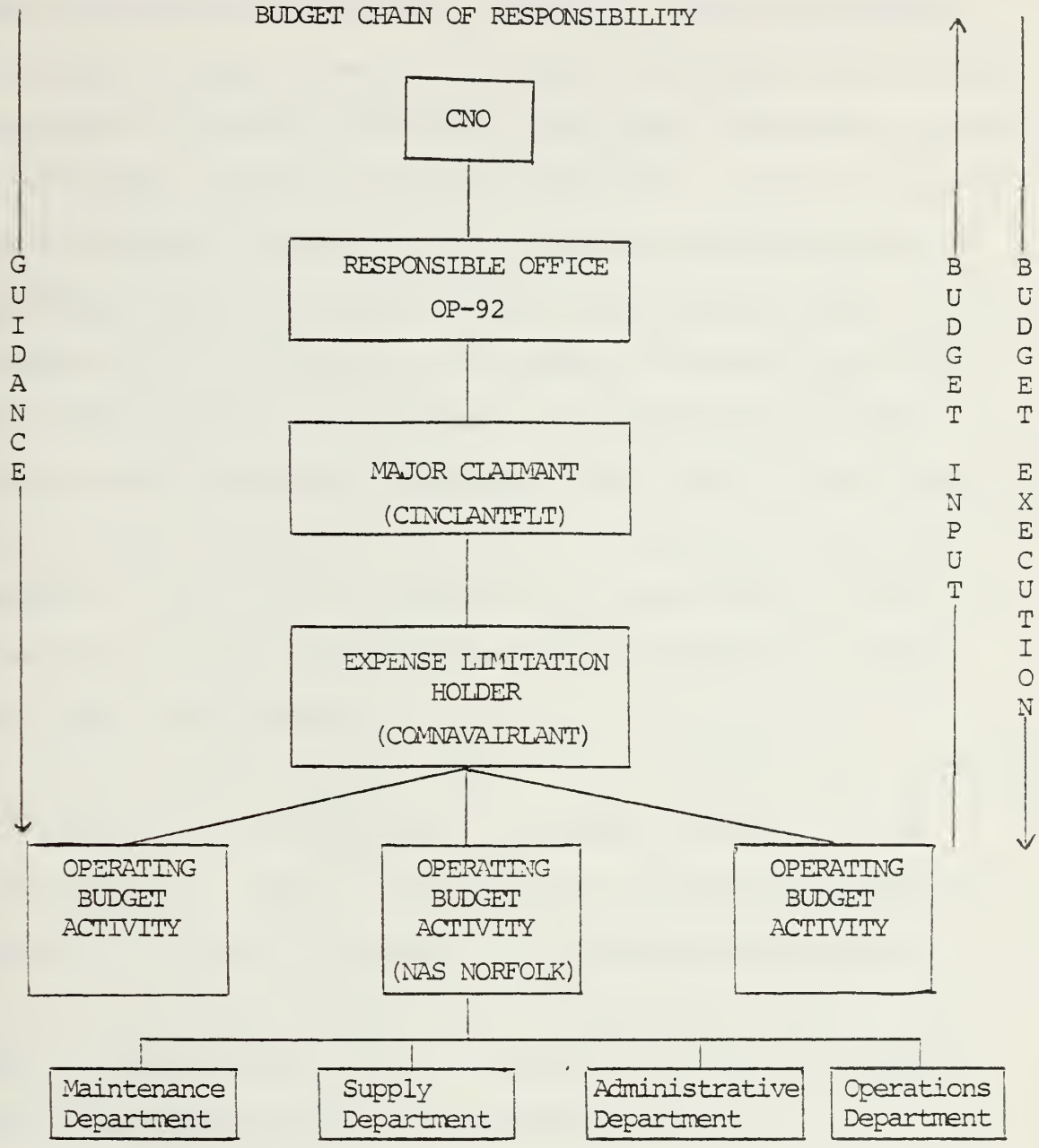

BUDGET CHAIN OF RESPONSIBILITY
CNO
RESPONSIBLE OFFICE
OP-92
MAJOR CLAIMANT
(CINCLANTFLT)
EXPENSE LIMITATION
HOLDER
(COMNAVAIRLANT)
OPERATING
BUDGET
ACTIVITY
OPERATING
BUDGET
ACTIVITY
(NAS NORFOLK)
OPERATING
BUDGET
ACTIVITY
Maintenance
Department
Supply
Department
Administrative
Department
Operations
Department
GUIDANCE
BUDGET INPUT
BUDGET EXECUTION

Figure 2 (11)

data requirements to the sub-claimants who report to him. The subclaimants collect all necessary budget and fiscal data and forward it back to the major claimant. It is then manually correlated, analyzed, fine-tuned, and sent to OP-92 as the major claimant's budget submission. Upon receipt of all of the major claimants' submissions, OP-92 conducts a "mark-up" session in which various changes are made to the amounts and allocations of the budget proposals received. Once this process is completed, the semi-smooth budget package for each major claimant is sent back to the originator for a final opportunity to reclama or rebut the proposed changes. This entire process takes place over an eight to nine month period, with various timing deadlines imposed throughout the process.

This research project dealt with a review of the problems and potentials of automating the budget process at the major claimant level. The intention of the author was to develop a theoretical model of a Financial Management Information System (FMIS) which could be utilized at the major claimant level and to compare this with the actual FMIS being implemented at CINCLANTFLT.

B. MAJOR CLAIMANT INVOLVEMENT WITH BUDGET AUTOMATION

Development of an automated budget at the major claimant or headquarters level is an extremely detailed and complicated task. Within the U.S. Navy, this task has been designated as Project 77-1, a subset of the Integrated

Financial Management Systems Project, under the guidance and direction of the Comptroller of the Navy (NAVCOMPT). Under this project, NAVCOMPT is developing a departmental level reporting system which will integrate to the fullest extent possible, the programming, budgeting, and accounting processes of Navy fiscal management into a system fully designed to fulfill the requirements of departmental managers. Because Project 77-1 is so complex, it has been modularized into several developmental efforts that will be integrated into a single departmental level system [15]. The stated goal of Project 77-1 is to provide an automated system for use in developing the annual Navy budget submission which is sent to the DOD as part of the government wide PPBS.

Project 77-1 has been broken down into four main sub-projects with tasks and responsible activities as described below: [15]

	TASK	ACTIVITY RESPONSIBLE
1.	Automation of the Head-quarters Budget Process. (O & MN)	Navy Accounting and Finance Center (NAFC-62)
2.	Automation of the Major Claimant Budget Process. (O & MN)	Commander in Chief, U.S. Atlantic Fleet (CINCLANTFLT)
3.	Integration of Navy Resource Model (NARM) and Navy Cost Information System (NCIS).	Department of the Navy Planning and Information Center (DONPIC) NAFC-3

		Regional Naval Data Automation Command (NARDAC)
4.	Interface of Shore Required Operational Capability (SHOROC) Classification Systems and Navy Accounting Classification.	Commander in Chief, U.S. Pacific Fleet (CINCPACFLT)

NAVCOMPT developed an incremental approach to accomplish the goal of automating the Navy budget. Details of the increments can be found in Reference 9. Increment four integrates the FMIS being designed at CINCLANTFLT into Project 77-1. The FMIS has been in development since 1970, and increment four of Project 77-1 was a logical and desired place to interface the two systems.

C. METHOD OF ANALYSIS AND RESEARCH

The basic sources of input into this paper were secondary sources of information; books, magazine articles, reports, letters, and messages on file at CINCLANTFLT Headquarters. In addition, the author spent some time at CINCLANTFLT's Headquarters interviewing various personnel directly and indirectly involved with design and implementation of the FMIS. The results of the literature search and visitation have been compiled in this thesis in order to provide a broad overview of the new system. The conclusions reached in this research effort, however, are those of the author alone and are not to be interpreted as those of the U.S. Navy or any other Federal Government Agency.

II. IDENTIFICATION OF NEED FOR BUDGET AUTOMATION

A. CINCLANTFLT CURRENT BUDGET CALL PROCESS

The Program Objectives Memorandum (POM) budget call process begins for CINCLANTFLT in January. Informal guidance from NAVCOMPT is received by CINCLANTFLT and corresponding informal guidance for sub-claimants is prepared for distribution. This guidance details what input data is necessary from the sub-claimants to meet the budget call requirements. These requirements range from format changes to newly instituted ZBB rankings. The guidance to the sub-claimants is distributed in February. Informal monetary targets or controls are given to CINCLANTFLT by NAVCOMPT in the January-March time frame and these informal controls are passed to the sub-claimants as soon as they are received. Sub-claimants then distribute the budget call to their operating budget activities, where data is collected and used in preparing the POM budget call response. The different sub-claimants return the completed budget calls to CINCLANTFLT by early May. By this time, CINCLANTFLT should have formal guidance and current control numbers from NAVCOMPT. CINCLANTFLT is required to collect all of the sub-claimants' data and combine it into one budget package. The completed budget package is due in NAVCOMPT about the 26th of June.

NAVCOMPT begins mark-up sessions as the POM budget call submissions are received from the major claimants. During

these mark-up sessions, NAVCOMPT sometimes make changes to the submitted formats or dollar requests. Occasionally these changes are significant. The mark-up session for the Navy Operation and Maintenance, (O & MN) budget is scheduled to be completed in the final week of July. O & MN funds are common to all activities and constitutes the wherewithal to carry on the day-to-day mission-related operations of an activity including civilian personnel pay, travel, maintenance of real property, utilities, materials and supplies, etc. [11] The mark-ups are then sent back to the major claimants, in this case CINCLANTFLT, where a reclama process may be initiated. During the next three working days, the major claimant is given the opportunity to rejustify original budget requests that were changed at the mark-up session. The reclamas are due back at NAVCOMPT within four working days. Though CINCLANTFLT budget personnel are involved in reclama reviews in Washington DC during the next week, the reclama due date essentially ends CINCLANTFLT's direct involvement in the POM budget call submission.

The discussion above describes the general scenario that is established for the POM budget call submission. However, there are many factors that have created slippages in submission deadlines.

Upon reviewing the actual budget call process in an interview with CINCLANTFLT's budget officer for POM 80, the author discovered that time frames and constraints actually

encountered differed from the theoretical scenario. It was noted during this review that CINCLANTFLT's annual budget is approximately 2.5 billion dollars, or more than 5% of the FY79 Navy budget. The breakdown of the CINCLANTFLT FY79 budget dollar is shown in Figure 3. It is evident from this figure that there are a significant number of different budget activities that must be accommodated. Each budget activity is a separate entity that receives O & MN funds from their respective major claimant. There are presently (1978) nine civilian budget analysts at CINCLANTFLT who prepare and execute this mammoth budget. Most of the problems that were noted in the POM 80 submission at CINCLANTFLT might have been avoided with an efficient and effective automated FMIS in operation.

With respect to the POM 80 submission, CINCLANTFLT did, in fact, receive informal budget call guidance from NAVCOMPT on time. CINCLANTFLT established their own informal guidance (based on NAVCOMPT's guidance) in January 1978, and on 2 February distributed the budget call to sub-claimants. Informal controls were received from NAVCOMPT in March 1978 and then passed on from CINCLANTFLT to the sub-claimants. These informal controls were 10% less than the prior fiscal year. The sub-claimants worked on budget preparation during March and April. By May, 1978, no formal guidance or controls had been received from NAVCOMPT. Hence, in early May, the sub-claimants submitted their completed budget calls

BREAKDOWN OF FY 79 BUDGET DOLLAR
AT CINCLANTFLT

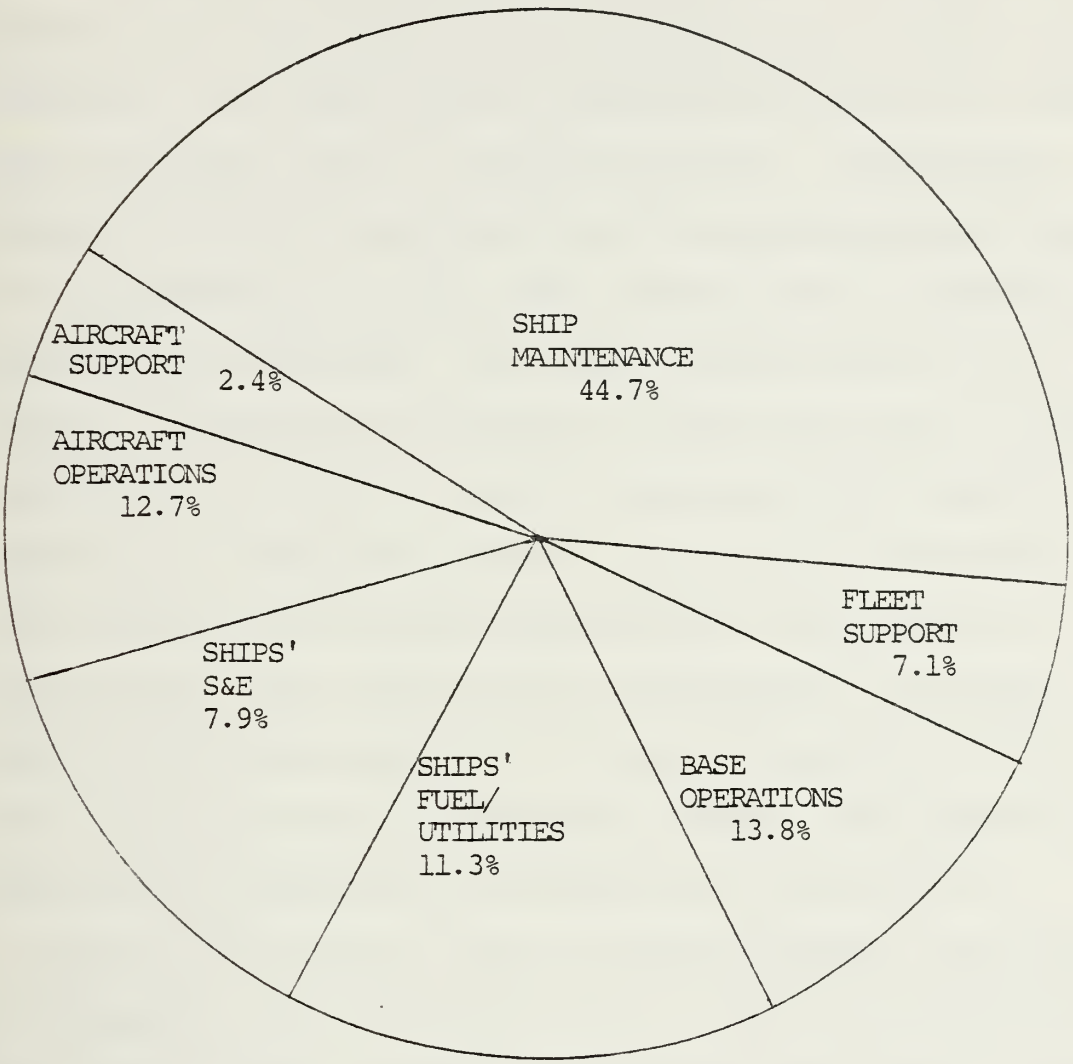


Figure 3

to CINCLANTFLT based on the earlier, informal guidance and controls originally supplied by CINCLANTFLT. By the end of May there were still no formal guidance or controls; however, on 1 June 1978 formal guidance was received from NAVCOMPT. The budget shop at CINCLANTFLT then had to compare the formal and the informal guidance. Significant changes in format requirements were discovered which had to be accommodated. On 12 June formal control numbers were received from NAVCOMPT. This left thirteen days to put together CINCLANTFLT's response to the budget call. This budget call had to be a single submission that combined the inputs of 23 subordinate budget activities. The inputs of these activities totalled approximately 9,000 pages of information. This was manually processed by the budget analysts and condensed into a budget submission of 1,600 pages that included 115 different formats. The budget call response was submitted to NAVCOMPT on 26 June 1978.

During the next two weeks, mark-up sessions were held at NAVCOMPT. The completed mark-ups were to be distributed on 22 July. This date was pushed back to 28 July, 4 August, and finally 8 August, at which time the mark-ups were received by CINCLANTFLT. Reclamas were due at NAVCOMPT within 72 hours of receipt. The reclama process was completed by 11 August 1978. At this point in time, the budget call submission for CINCLANTFLT was essentially complete.

The biggest problem encountered by the budget shop was the inordinate number of manhours that were spent adding

and subtracting numbers and rearranging formats. NAVCOMPT passed on both the formal guidance and controls as soon as they were received from higher authority. NAVCOMPT has no control over the external parties that pass budgetary information and guidance down to them. Because the rules and requirements in the budget arena change so much and so often, it is not unusual for budget guidance and controls to be issued later than expected. Hence, this situation appears to be one that must be accepted and dealt with in the best manner possible. The resulting consequence at CINCLANTFLT was the accumulation of 1,600 overtime hours during the thirteen day span from 13-26 June. Overtime was accumulated by the nine budget analysts plus additional personnel. This occurred because format and control changes could not be made to the manual system in a timely manner. A large part of the overtime was spent punching calculators and rewriting formats. The overtime not only cost the government money, but it also greatly affected the attitudes of the people performing the work. Extremely long working days quickly drain a person's desire and competence.

Another detriment resulting from excessive time spent on number manipulation is that the budget analyst does not have sufficient time to perform his most important function of analyzing the budget. Given the time to properly analyze the budget submission may help the analyst to discover discrepancies and necessary changes before the budget is

sent to the NAVCOMPT mark-up sessions. One viable alternative to the system described above would be to automate as much of the budget process as is feasible. Automating the submission portion of the budget has far reaching ramifications. Developing an extensive data base from which a proposed budget could be drawn and then updated through change and tracking programs would significantly reduce the current manual workload. This would provide more time for the budget analysts to devote to analyzing the budget. This is just one area where improvements might be made, but it is a very important one at the major claimant level.

B. THEORETICAL MODEL OF A FMIS

The first step in designing and implementing a FMIS is the development of a model. A valid model can be used as a blueprint for a specific organization, such as CINCLANTFLT, to plan and manage the development of a financial management system. Such a model, which could be utilized, is depicted in Chapt. II, page 18 of the Management Information System Handbook. [4] This model was used by the author as a standard to measure against the actual development of the FMIS at CINCLANTFLT. However, this is a theoretical model and variations from it should be expected in actual implementation. It provides general guidance for successfully converting from a manual to an automated system. The model is a detailed network with seventy-two nodes that depict the

entire growth cycle of a new information system. The more important aspects of this model were reviewed and qualitative comparisons were made with actual performance. In this model, the roles of management, users, and the information services department are significant in developing a successful FMIS.

The first area that must be examined is that of top management; in this case NAVCOMPT. There are a number of areas that top management must deal with: first, they must make a realistic determination that it is necessary to automate the Navy budget; second, they must give proper direction concerning what they want accomplished; third, they must assure the resources are available to successfully undertake the conversion from a manual to an automated budget system; fourth, they must assign subordinate commands to do feasibility studies, do cost-benefit analyses, determine both hard and software requirements, and do actual system/sub-system development; fifth, top management's strategy must be consistent throughout the design phase and the actual implementation of the system; lastly, the change must be publicized as a functional improvement rather than as a structural reorganization of the system. [4]

Another area that is crucial is the working relationship among top management, system users and Automated Data Processing (ADP) personnel. Developing any good, workable system without a strong cohesion among these groups is

extremely difficult. Management must be sensitive to the needs and limitations of the users and ADP personnel. If top mangement decides to assign management responsibilities to a subordinate command to design and implement a pilot program, the subordinate manager's role becomes more critical. There are several areas that personnel in the subordinate command must become especially sensitive to when designing the new system. Perhaps the most important role is that of mediator among users of the FMIS and the ADP department. [2] The manager must create and maintain a harmonious working relationship among these groups thus increasing the probability of creating both a workable and a usable system.

There are other areas in the model that are important to the manager, but most of them fall under the general auspices of the manager's ability to maintain the aforementioned relationships. Specifically, there are certain actions the manager must take to channel energies in the right direction. A steering committee comprised of users and personnel of the information services department must be established to make decisions on proposed allocations of resources. [5] The users must have a real input into the development of the system; if not, the chances of the users supporting the system fully are minimal and the system will never be utilized to its full potential. [2] The information services department must be sensitive to the

outputs the users require. It is relatively easy to overload users, that is, to be insensitive to the relevance of information and thus send irrelevant information to the decision makers.

The system must be flexible enough to meet the needs and requirements of different individuals. The data base must be large enough, and the retrieval programs flexible enough, to permit the users to select the output format and level of summarization they desire. Additionally, management must develop and maintain favorable user attitudes during the design of the system. [2] The users should be consulted during each step of the design process to determine their criteria for measuring the success of the system. This user interface is vital. One way to improve it is to use on-line systems to reduce the burden, on the users, of input and output processing. [3] This makes it mechanically easy to use the system.

Training programs for the users must be established in the earliest stages of development. The training program must address both the technical and behavioral aspects of the FMIS development. [3] As to the former, the users must know how to properly input data into the system and also how to effectively utilize output data. The behavioral considerations are very important. Users not sold on the system in the beginning will not use it. Once users are convinced the new system is not a threat to their job security,

training sessions must be systematically arranged. Training must be an on-going matter that is constantly monitored by management. It must be conducted by user management and organized by user representatives who are participating in the system development effort. System analysts should lecture on professional subjects. Sessions for direct users should be timed to finish before system implementation. Personnel more remotely concerned with system operation may receive instruction after implementation.

Analysts and programmers must also be properly trained before they can be effectively employed in the system effort. They must be made aware of such things as the objectives of the user's organization, the requirements, constraints, and design of the new system, and other technically oriented aspects of system development. This training must be completed by the start of the systems development phase. [3]

Before the system is fully implemented, each program and procedure must be tested separately. Once completed, the (sub) system must be tested to ensure that it will operate without disturbance, that its performance is up to standard, and that it meets the requirements originally established. The foregoing involves testing the interfaces already in use as well as the interfaces which are built in for future extensions. Problems that arise must be thoroughly examined and corrected. The test should then be re-run. When completed, program and file conversions should be

commenced. Finally, the (sub) system is placed in operation. During this "running in" period, close cooperation and efficient communication among ADP personnel and users is essential. [1] Any problems that arise must be immediately corrected.

When evaluations of the early results indicates that the (sub) system is operating smoothly, it can be turned over to the user.

Research indicates there are hundreds of potential problems that could arise when developing a FMIS. [2] The responsibility for detecting and correcting problems lies with both the user and the information services department, but the overall coordinator must be management. Expertise should be available to solve almost any technical problem in the form of the resident or local ADP staff. The one problem that requires more than technical expertise is that of organizational behavior when introducing a change of this magnitude. Henry Lucas contends that "the major reason most information systems have failed is that we have ignored organizational behavior problems in the design and operation of computer-based information systems. If steps are not taken to understand and solve these organizational behavior problems, the system will fail." [2] This statement indicates the major role that management must play. Management is the glue that holds everyone and everything together. Management must help the users and, to a lesser extent, the information services department, to successfully cope with the impending changes.

III. ANALYSIS OF FMIS (PHASES I, II, III)

A. OBJECTIVES OF FMIS

The FMIS was submitted by CINCLANTFLT to OP-92 under Project Request 20A002V to provide support to the CINCLANTFLT staff in their financial function as a major claimant accounting activity. The FMIS was designed to provide staff financial managers assistance in the planning, budgeting, and monitoring of the current budget execution in supporting the Atlantic Fleet and assigned Shore Facilities. Planning and budgeting was based on unit costs generated from execution data, escalated and applied to projected force levels. The data base was designed to provide information at the lowest level so that summarization or information at any level could be displayed. It was oriented to the Planning, Programming and Budgeting (PPB) cycle. This cycle for CINCLANTFLT and its subordinate commands covered a period of six years for the POM, seven years for the FYDP, and three years for budget submission and execution. When the FMIS is completed, it will assist the CINCLANTFLT Staff in the performance of the following tasks:

1. Generation of Requirements:
    a. Development of Requirements for POM & FYDP;
    b. Development of Budget Guidance for Subordinates and Budget Call Data

2. Budget Formulation and Submission:
    a. Review of CINCLANTFLT Subordinate Budget Submissions;
    b. Budget Consolidation;
    c. Generation and Submissions to CNO, DOD, Congress;
    d. Budget Apportionment.
3. Budget Execution:
    a. Expense Limitation Authorization;
    b. Budget Accounting;
    c. Budget Analyses.

Since CINCLANTFLT was tasked with developing the prototype FMIS, the system was designed to interface both vertically and horizontally. The vertical interface consists of an interchange of data between the sub-claimants and CINCLANTFLT as well as interchanges with CNO and the Comptroller of the Navy. The horizontal interface is between the FMIS and other major Navy information systems.

The FMIS is a Management Information System designed to support the CINCLANTFLT staff in the management of resources. These resources include:

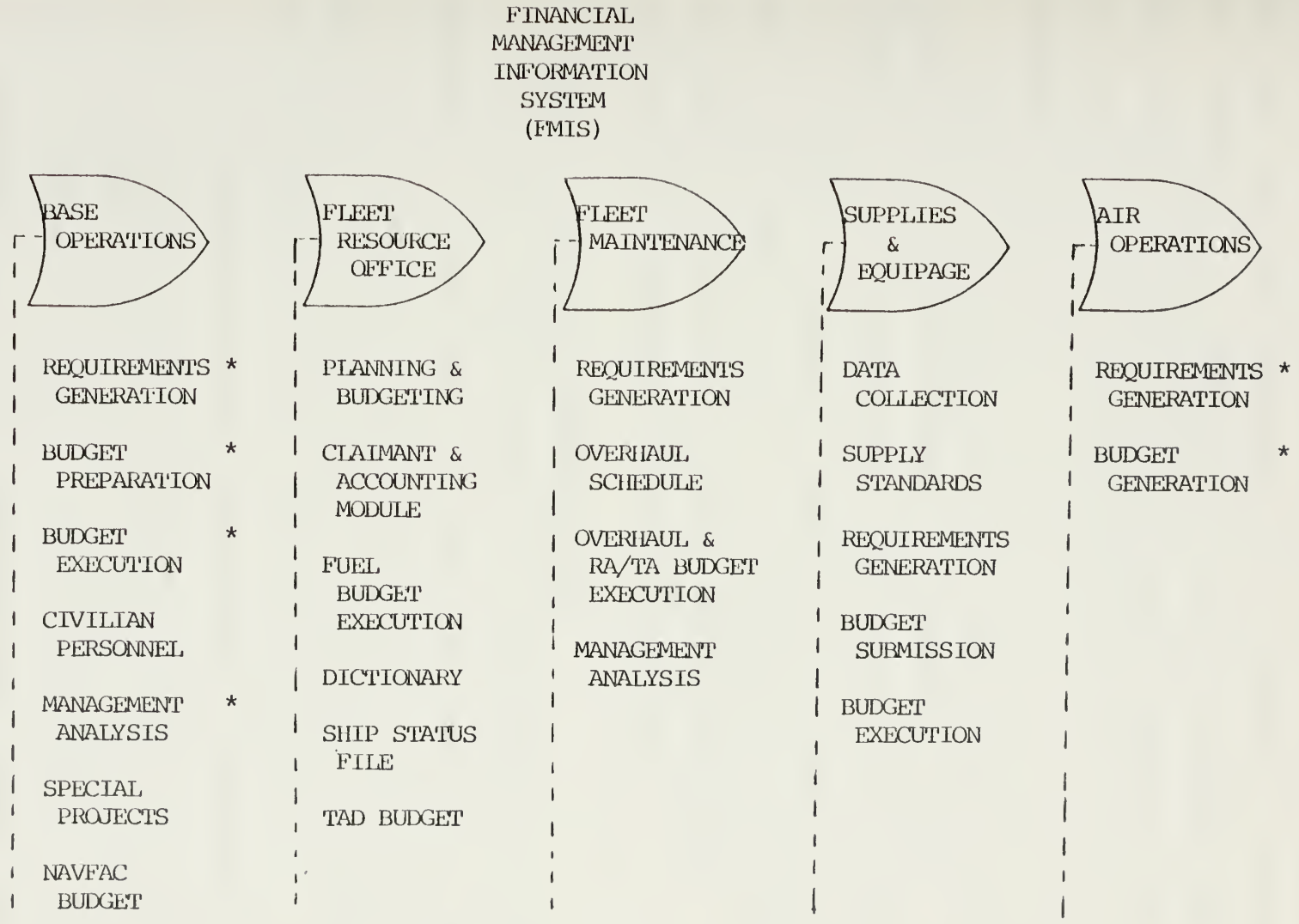
Personnel	Ships
Aircraft	Supplies
Equipment	Facilities
Material	Funds

The system should provide the capability to match resources with requirements and, through the identification of shortfalls, to assist the staff in the reprogramming of available resources or justification to higher authority of the requirement for additional resources. In use, the system should provide timely information which can be rapidly extracted without the manual production of massive reports. The user should have the capability to extract selected data in any format required. To do this, CINCLANTFLT planned to make extensive use of interactive devices such as cathode ray tubes (CRT's). In order for the system to be viable, the user must be able to step through a problem and have displayed immediately the possible solutions so that corrections can be made quickly.

The FMIS was broken down into five subsystems. The subsystems were further broken down into twenty-one modules, most to be implemented at various times during Phases I, II, or III. Figure 4 illustrates how the FMIS was divided into subsystems.

While developing the functional description, the FMIS NARDAC Team implemented an interim capability on the CDC 1604 computer system in 1972. This satisfied the immediate needs of the Fleet Comptroller's office in performing the required NCIS reporting functions. In 1974, FMIS was fully implemented on the new Worldwide Military Command and Control System (WWMCCS) hardware and software currently installed

FMIS SUBSYSTEMS & MODULES



* Functionsl descriptions of these modules not developed at time of research

Figure (4)

at CINCLANTFLT. WWMCCS is a computer system designed to interface with many different facilities located throughout the world such as at Washington D.C., Norfolk Va., Honolulu, etc. WWMCCS allows different activities to interact and share system resources. This interactive capability will be an advantage when all Navy activities convert to an automated budget.

Because of the complexity of the FMIS project and the possibilities of future changes as dictated by higher authority, it was decided that implementation of the FMIS should proceed in manageable phases with a turnover at the end of each phase. Figure 5 is a breakdown of the different phases of FMIS which indicates which modules were scheduled for implementation within each phase.

B. PHASE I DESIGN AND IMPLEMENTATION

The initial thrust of FMIS was called Phase I. It was designed to collect budget execution data in specific areas to allow the building of data bases vital to future FMIS development. The specific areas of development required to be accomplished under Phase I are listed in Figure 5.

The Claimant Accounting Module (CAM) was designed to perform the major claimant accounting functions required of CINCLANTFLT, monitor budget execution, and provide all staff divisions with execution data in their specific areas of responsibility. The CAM provides on-line capabilities for processing as well as a batch type operating environment.

BREAKDOWN OF FMIS MODULE IMPLEMENTATION
WITHIN EACH PHASE

PHASE I

1. CLAIMANT ACCOUNTING MODULE OF THE FLEET RESOURCES OFFICE SUBSYSTEM
2. FUEL MODULE OF THE FLEET RESOURCE OFFICE SUBSYSTEM
3. NAVAL FACILITIES BUDGET SEGMENT
4. SPECIAL PROJECTS SEGMENT OF THE BASE OPERATIONS SUBSYSTEM
5. FMIS DICTIONARY

PHASE II

1. PLANNING & BUDGETING MODULE
2. CIVILIAN PERSONNEL MODULE-BUDGET EXECUTION PHASE
3. DATA COLLECTION & SUPPLY STANDARDS MODULES
4. BUDGET EXECUTION & REQUIREMENTS GENERATION MODULES OF THE SUPPLY & EQUIPAGE SUBSYSTEM
5. SHIP STATUS FILE
6. OVERHAUL SCHEDULE, BUDGET EXECUTION AND REQUIREMENTS GENERATION MODULES OF THE FLEET MAINTENANCE SUBSYSTEM

PHASE III

1. BUDGET PROJECTION & SUBMISSION MODULE OF THE SUPPLY & EQUIPAGE SUBSYSTEM
2. BUDGET PROJECTION & FORMULATION FOR THE FLEET MAINTENANCE SUBSYSTEM (MANAGEMENT ANALYSIS)
3. BUDGET PROJECTION AND FORMULATION FOR THE FUEL MODULE
4. BUDGET PROJECTION AND FORMULATION FOR THE TAD SEGMENT OF THE PLANNING AND BUDGETING MODULE
5. BUDGET PROJECTION AND FORMULATION FOR THE CIVILIAN PERSONNEL SEGMENT OF THE PLANNING MODULE
6. BUDGET FILE FOR THE FLEET RESOURCE OFFICE SUBSYSTEM, THE CONTROL MASTER FILE AND A FYDP MASTER

Figure (5)

Remote terminals can be used to input data, initiate runs, correct erroneous data, obtain statistics, query files using the Worldwide Data Management System (WWDMS), a data management system associated with all WWMCCS computers, and review output data. There are twenty-seven reports that the CAM can produce in hard copy format. There are two programs that can produce output on a CRT or Teletype (TTY) device, and a WWDMS dictionary was incorporated into the system to provide users with a query capability. This allows users immediate visual recall of current or past budget execution data. This information can be used to help analysts make a large number of decisions concerning their budget area.

The Fuel Module was designed to provide automated support to the Fleet Comptroller's Office to monitor and control CINCLANTFLT fuel funds and report requirements. This module accepts data from incoming monthly fuel reports from each LANTFLT ship, edits the data, produces error reports and correction cards, and maintains a master file of detailed data for analysis.

The projected output from the Fuel Module was a total of sixteen hard copy listings and reports and two different punched card decks. These outputs ranged from listings of transactions to analysis and control reports. The punched card decks were produced to interface with the Maintenance Support Office and to project monthly fuel obligations which

are forwarded to Fleet Accounting and Disbursing Center Atlantic (FAADCLANT) for entry into the Navy Accounting System. Additionally, this module provides users with data on an as required basis through WWDMS capability.

The Naval Facilities Budget Segment Module was included in Phase I because the Chief of Naval operations required major claimants to submit budget exhibits for facilities management functions in compliance with current OPNAV instructions. This module accepts data submitted by subordinate commands in accordance with the budget call, edits input data for format, validates the data against the FMIS dictionary and produces reports at all required levels, from activity to claimant budget submission. Five basic reports are generated by the system and WWDMS capability is provided to allow users to investigate areas of interest and obtain required information.

The final module was the Special Project segment. This module was designed to provide assistance to the CINCLANTFLT staff and Naval Facilities Engineering Command in tracking project requests for special construction, repair, and equipment from the submission of the requests to funding or cancellation. This module provides important information for the POM and budget generation processes. Three reports are produced by this module; The Error Listing and The Unfunded Minor Construction, Repair and Equipment Projects Report will be generated with each processing cycle; The Funded Project Report will be available to the user as an option.

Phase I has been completed and is presently on-line at CINCLANTFLT. All programs have been accepted by the Operations Support Facility which means they will perform any required maintenance on FMIS software. The user staff has expressed complete satisfaction with the implementation of the components in Phase I. The data base is detailed enough to permit users to capture any level of data. Based on actual usage, the Fuel and Claimant Accounting Modules proved to be more useful than expected, as they have been constantly exercised.

C. PHASE II: DESIGN AND IMPLEMENTATION

Areas selected by the user staff for the Phase II development were logical building blocks in the process of producing the full capabilities of the FMIS system. The Phase II areas included:

1. Planning and Budgeting Module
2. Civilian Personnel Module-Budget Execution Phase
3. Budget Execution and Requirements Generation Modules of the Supply and Equipage Subsystem
4. Overhaul Schedule, Budget Execution, and Requirements Generation Modules of the Fleet Maintenance Subsystem

The Planning and Budgeting Module is part of the Fleet Resource Office Subsystem. This segment was designed to provide Ships Force Data to all subsystems in the FMIS to be used in requirement generations and budgeting functions.

The Ship Status File was generated from an interface provided by the CNO Ships Management Information System and update provided by the Fleet Comptroller's Office. Data on every ship in the Atlantic Fleet was contained in this file with change information indicated covering a ten year span. This module provides both an on-line, interactive capability and a batch type operating environment. These files are queried by users utilizing WWDMS capabilities.

There are seven hard copy reports which are generated as requested by the user. These reports are:

1. Status of Ship Forces Error Report
2. Status of Ship Forces Report
3. Ship Year Summary Report
4. Ship Year Log Report
5. Ship Year Net Change Report
6. Ship Status History Report
7. Ships Management-Information System (SMIS)/ LANTFLT Variance Report

The Budget Execution phase of the Civilian Personnel Module was designed to establish a data base containing information required for development of requirements generation and budgeting functions. This segment was designed to replace the manual system previously employed by the Fleet Comptroller's Office. The segment provides an on-line, interactive capability as well as a batch type operating environment. Remote terminals may be used to input data, initiate runs, correct erroneous data, and query the

file using the WWDMS capabilities. Historical data is maintained by activity, type of employment, manhours, dollar values, and allowances for direct and reimbursable funding.

These inputs into this segment come primarily from the monthly NAVSO 7140 reports received from payroll activities. Other inputs are the FMIS Dictionary from the Claimant Accounting Module, the CIVPERS 7410 Master File and the FMIS Dictionary. The FMIS Dictionary is designed to support all subsystems in FMIS. Various reports are produced by this segment such as a quarter-to-date summary, a year-to-date summary, and a one page work sheet for the user staff. Each of these reports displays civilian personnel budget execution data.

Three modules of the Supply and Equipage (S & E) Subsystem were designed to be implemented during Phase II of FMIS. These three were the Data Collection, Budget Execution, and Requirements Generation modules. The Data Collection and Budget Execution Modules were similar to previous modules in that they produced part of the comprehensive data base for Phase III, Budget Generation. The modules will provide users with execution reports comparing obligation, consumption, and planning data to be used to monitor the execution of the Supply and Equipage budget. A Resource Requirements Exhibit is provided for the POM showing projected requirements, current control numbers, and the differences or shortfalls between requirements and controls.

Inputs which reflect consumption data for LANTFLT activities are posted monthly into this segment's data bases. These data are used to update the S & E Consumption Master File. The following files maintained in the Claimant Accounting Module of the FMIS are input to the S & E Subsystem:

1. FMIS Dictionary
2. Current Year 2171 Obligation/Expense Master
3. Prior Year 2171 Obligation/Expense Master
4. Spending Plan Master
5. Ship Year Summary File
6. FYDP/Control Number File

Additional user generated transactions containing additional requirements, escalation factors, Military Sealift Command (MSC) charter, ship-year add-on, and control numbers may be processed.

The final segment of Phase II design and implementation consisted of three modules of the Fleet Maintenance Subsystem. These are the Overhaul Schedule Module, the Budget Execution Module, and the Requirements Generation Module. These modules were designed to provide the user staff with the capability of maintaining a current up-to-date Atlantic Fleet Overhaul Schedule. Included in these modules were data on prior year, current year, budget year, and five outyears to be utilized for analysis, budgeting and requirements generation for future years. This segment also provides a series of Funding Status Reports which provide current status

via hard copy reports and which establish a historical basis for budgeting and requirements. Overhead figures are generated by type and repair activity with allowances for location factors and escalation to be applied to scheduled repairs. Various reports are produced as backups for inclusion in the POM and budget updates.

The major inputs for this segment come from a reformatting of the Ships Management Information System interface file in the Planning and Budgeting Module into the format of the Overhaul Schedule File, which is utilized to compare and produce a variance report for analysis by the Fleet Maintenance staff.

There are three functions of the Overhaul Schedule Module. The first is to initialize and update the Atlantic Fleet Overhaul Schedule and change tracking files. The second is to perform edits, prepare reports of erroneous transactions and generate repair status change cards to interface with the Planning and Budgeting Module Ship Status File. In the third function, the Report Generation Phase produces the Atlantic Fleet Overhaul Schedule, the Overhaul Planning Evaluation Report, the Bow Wave Defferred Overhaul Report and various transactions and error reports, plus a Change History Report.

The Budget Execution Module was designed to generate the following reports:

1. Restricted/Tender Availability (RA/TA) Funding Status Report

2. Ship Overhaul and RA/TA Funding Status Report
3. Repair of Other Vessels (ROV) Funding Status Report
4. Regular Overhaul (ROH) Report
5. ROH Funding Status Report
6. History File Report
7. Delinquent Departure Report Listing
8. Ship Maintenance Budget File Report

All of the data outputs via the Overhaul Schedule Module and the Budget Execution Module were designed to provide information to meet needs such as the provision of data to be used in preparing future overhaul budget submissions. The Requirements Generation Module is designed to operate and contribute to the same goals. Its functions include:

1. Preparation of a Scheduled Repairs Extract
2. Generation and/or update of the Requirements Generation Unit Price
3. General Requirements Extract and Update
4. POM Extract and Report Generation
5. POM summary Report Generation and Report Alternative Run
6. Overhaul History Unit Price Generator

As with Phase I, Phase II has been completed and is presently (November 1978) on-line at CINCLANTFLT. Programs have been accepted by the Operation Support Facility, and the user staff is satisfied with the system in its present

state. Both Phases I and II are continually being updated to collect data more efficiently. However, a major goal of the two phases remains the same: to build a data base that can be utilized for implementing Phase III.

D. PHASE III: JUSTIFICATION AND DESIGN

Phase III of FMIS is designed to provide automated procedures to replace manual procedures used to formulate an approximate 2.5 billion dollar budget at CINCLANTFLT. Phase III must be viewed in terms of its relationship to the total FMIS system, the criticality of its development, the adverse impacts if it is not developed and cost/benefit factors.

The overall FMIS objective, as stated earlier in this thesis, is to provide automation of both the accounting and budgeting function in an integrated approach to financial management. Because of the scope and complexity of the system, FMIS has been developed in interrelated phases with user re-evaluation before development of a succeeding phase. Re-evaluations include requirement prioritization, consideration of available resources and benefits to be derived. Phases I and II were developed to automate CINCLANTFLT accounting requirements and also to establish a prerequisite data base for use for Phase III budget functions. Thus, Phases I and II were building blocks for Phase III. Implementation of Phase III becomes more critical as justification for budget resources becomes more

difficult to accomplish by manual processing. This problem is compounded by the fact that manpower resources to perform budget processing have diminished; zero base budgeting and other requirements dictated by higher authority have increased the overall task; and a lean funding environment has dictated more efficient management of total fleet resources. Automated procedures already incorporated at the CNO level, through Project 77-1, for budgeting processes indicate the necessity of a similar development effort at the major claimant level.

The impact of not developing Phase III is far reaching. If manual procedures are continued, and manpower resources are reduced, there will be an inevitable degradation in the effective and efficient management of Fleet resources. Without Phase III budget automation, an important labor saving tool will not be available at the major claimant level. If budget automation is delayed, not only will budget preparation cost more as labor costs increase, but also it will have to be accomplished under extreme pressure without the orderly development process provided by the FMIS effort. Additionally, user/developer interest and experience will have to be rekindled if it is developed later. Finally, without Phase III, Phases I and II do not provide sufficient management capabilities to completely automate the Navy budget process and achieve the desired goal of FMIS.

The justification for developing Phase III has been divided into three separate areas. They are:

1. The value of the resources managed.
2. Direct and spin-off benefits.
3. The possible exportation of an automated package to other claimant commands and the integration of budget submissions.

The annual budget for CINCLANTFLT is approximately 2.5 billion dollars. The estimated development costs for Phase III are $700,000. This is a relatively small investment, considering the value of the benefits that will be derived from implementation. For example, development of the FYDP involves about 3,000 manual transactions for each budget submission. This would be automated in Phase III. Additional automated budget benefits will include budget tracking histories, computer generated spreads of financial budget data, inputs for escalation factors, and production of various exhibits required for budget submissions. Automation of these manual tasks will result in further benefits such as increased accuracy, more timely data, wider visibility of budget interrelationships and the ability to analyze and determine "what if" conditions. The potential dollar savings are significant. Budget experts conservatively estimate that the average cost of a single error in a major claimant budget submission, as a result of incorrect input, could run from three to five million dollars. [14] Hence, the possibility exists that the cost savings involved in avoiding a single error in a single year could offset the entire development cost of Phase III.

The successful implementation of Phase III at CINCLANTFLT would have applications beyond current CINCLANTFLT operations. It is a system that could be applied to budget submissions for other major claimants, such as CINCPACFLT and CINCUSNAVEUR. Some parts of FMIS have already been exported to other major claimants; the Claimant Accounting Module is a case in point.

The objectives of Phase III development are:

1. Develop Budget Projection and Formulation Modules for the Supply and Equipage and Fleet Maintenance Subsystems
2. Establish FYDP data base and Control Number Files for the Fleet Resource Office Subsystem
3. Establish Requirements Generation, Budget Projection and Budget Formulation for Fuel, TAD, and Civilian Personnel Modules

Budget Projection and Formulation for the Supply and Equipage Subsystem will be developed from historical obligations, apportionment data from prior year, force levels from the Planning and Budgeting Module and controls from the Control Master File. The Budget Master File will provide prior and current year data. The staff sponsor and analyst will review the budget year spread, which will be based on the new force levels and functional program controls for the budget year, to determine if any revisions or redistributions are necessary. If they are, the processing will be accomplished by a revision and tracking program. This procedure provides the capability to project a budget

spread that can be forwarded to sub-claimants for review and revision.

Budget Projection and Formulation for the Fleet Maintenance Subsystem will be based on data obtained from the Overhaul Schedule Master File, national manday rates, and/or historical overhaul costs obtained from departure reports. Also required for this module, are force levels from the Planning and Budgeting Module, the latest Budget File Information, and controls from the Budget Control File. The initial spread would be made showing both a funded and unfunded condition. The staff sponsor and budget analyst would then go through basically the same procedures for revision and redistribution as is used in the S & E subsystem budget formulation.

The FYDP data base and Control Number files for CINCLANTFLT are designed to provide a current log of control numbers to be used by the Budget Shop for examination/correction and input to update the Control and Budget Files. These files are extremely important because it is from these files that the other budget formulation modules extract current controls.

The Budget Projection and Formulation component of the Fuel Module is designed to derive its data from the Force Level Master File and historical data such as tempo of operations and consumption from the Fuel Module. Once information is provided by appropriate staff sections

concerning fleet distribution and projected fuel prices, the initial budget is formulated and provided to the staff for analysis. Changes are implemented by the Revision and Tracking Programs.

The Budget Projection and Formulation for the Temporary Additional Duty (TAD) segment of the Planning and Budgeting Module is based on a straight line projection from the prior years and Congressional budget data maintained in the TAD Master File. Exhibits based on these data, plus the prior two years data, will be sent to the sub-claimant at the beginning of the budget cycle for mark-up. The mark-up exhibits will be used to update the master and tracking files. Once this is accomplished, budget exhibits will be produced.

The Civilian Personnel segment of the Planning and Budgeting Module will base its budget projection on the use of end strength controls provided by the budget analyst. The staff will adjust the projected spread to incorporate adjustments deemed necessary. Exhibits will be made available to users on request.

The current target date for Phase III implementation is June 1980. Once Phase III is operational, the remaining segments of FMIS that have not been developed, such as the Air Operations Subsystem, will be designed and implemented in Phase IV. As of the date of this study, June 1982 has been established as a target for interfacing CINCLANTFLT's FMIS with NAVCOMPT's Project 77-1.

IV. CONCLUSIONS AND RECOMMENDATIONS

The author's conclusions and recommendations pertaining to this study fall into two major categories: The first is a review of the on-going FMIS effort at CINCLANTFLT as compared to the theoretical model of an FMIS presented in Chapter I, part B of this thesis. Variations between the actual development of the FMIS and the model are noted and discussed in the following paragraphs together with recommended courses of action. The second category is a general review of the automated budget effort at CINCLANTFLT. With respect to this category, the author presents some general conclusions, identifies some potential problems and recommends some appropriate, corresponding courses of action.

A. FMIS MODEL VERSUS ACTUAL FMIS IMPLEMENTATION

It was evident after comparing the theoretical model with the actual FMIS development at CINCLANTFLT that there were not many major variations between them. It was the author's view that top management, in this case NAVCOMPT, made a realistic determination that it was necessary to automate the Navy Budget process. The projected shortages of people, money, and time made budget automation the only cost-effective alternative to manual preparation. In general, actual development appears to have followed the proposed model, with only a few minor observed exceptions.

These exceptions were related to the roles that management, user, and ADP personnel played in the development of the FMIS at CINCLANTFLT.

1a. Observation: It appeared that NAVCOMPT and CINCLANTFLT's automation goals, and their corresponding organizational strategies for attaining these goals, were not consistent. One example was the potential conflict between a word processing effort and a more fully automated approach. Both are worthwhile and necessary efforts to effectively automate the budget. However, if one organization follows one direction while the other takes a different direction, the finished product may not resemble what NAVCOMPT desires in the completed system.

1b. Recommendation: It is recommended that personnel involved in the budget automation effort at NAVCOMPT and CINCLANTFLT meet and re-evaluate their goals and the corresponding strategies for attaining these goals. Additionally, it is recommended that periodic meetings be scheduled throughout the development and implementation of Phase III to review goals and strategies.

2a. Observation: Interviews with various CINCLANTFLT personnel involved in the budget automation effort led to a general observation that a problem might exist in communications among NAVCOMPT, CINCLANTFLT budget analysts and ADP personnel.

2b. Recommendations: It is recommended that the parties involved in the automation effort meet on a regular

basis to discuss any problems they may experience in the development of Phase III.

3a. Observation: Interviews with potential FMIS users at CINCLANTFLT indicated that there was a need for more mediation than was presently accomplished. Specifically, it appeared that the FMIS users and ADP personnel did not completely undertand what each group's responsibilities were. For example, it appeared to the author that ADP personnel at CINCLANTFLT were not aware of exactly what a budget analyst's responsibilities include. Likewise, not all of the budget analysts at CINCLANTFLT were aware of the problems ADP personnel encounter when developing information system programs.

3b. Recommendation: The model dictates that management must serve as a mediator between users of the FMIS and the ADP department. Familiarizing these two groups with each other's jobs and responsibilities can lead to a more harmonious working relationship during FMIS development.

4a. Observation: The author deduced from interviews with FMIS users that some of them felt that FMIS was not being tailored to their operational needs. For example, one budget analyst felt the FMIS would not be useful in developing his particular segment of the budget because format requirements were constantly changing.

4b. It is recommended that FMIS users be asked what kinds of budget formats, change and tracking capabilities,

and other visual display data they need to perform their jobs in a more efficient and effective manner.

5a. Observation: Interviews with potential FMIS users indicate there were some who were still very much against any type of automation.

5b. Recommendation: The model tasks management with developing and maintaining favorable user attitudes during design of the system. It is recommended that more training sessions be established in order to accomplish this goal. The first objective of these training sessions should be to gain acceptance by the users. One individual thought FMIS would be nothing more than a big calculator, able to manipulate numbers faster than presently possible. This is the type of misunderstanding that must be cleared up in training sessions as soon as possible. Finally, the author noted a general feeling that the automated system would replace people. This was not a stated goal of FMIS, and the users must be convinced in training sessions that FMIS was developed to assist and help them perform their jobs in a more efficient and effective manner.

6a. Observation: There is a high probability that a high rate of turnover of FMIS users will be experienced in future years.

6b. Recommendation: Because FMIS is a dynamic system that is constantly being fine-tuned to better meet the user's needs, it is recommended that training sessions

be conducted on a continuing basis. This will assist initial users as well as new budget analysts at CINCLANTFLT. If these sessions are not held on a periodic basis the system will not achieve its full potential. These sessions should be held monthly until FMIS is fully implemented, and on a less frequent basis thereafter. The sessions should concentrate on both behavioral and technical aspects of FMIS during the development phase, and primarily on technical aspects after FMIS is fully implemented.

B. GENERAL RECOMMENDATIONS ON FMIS IMPLEMENTATION

In conjunction with the present effort at CINCLANTFLT and NAVCOMPT to automate the Navy budget, the following observations/recommendations are submitted for consideration:

1. It is recommended that development of the FMIS at CINCLANTFLT continue. This recommendation is based on the past successes of Phase I and II implementation, plus the cost-benefit considerations of implementing Phase III discussed earlier in this paper. With computer technology continually evolving, automation of the Navy budget process is a logical direction to follow. Phase III development should be continued on a vigorous basis.

2. With Phases I and II operable at CINCLANTFLT, it is recommended that extensive efforts be made to continue building the data base in preparation for Phase III implementation. As stated by a resident ADP specialist at CINCLANTFLT, the larger the data base available for

utilization, the more effective Phase III will be when implemented.

3. During the last two years, ZBB has become an integral part of governmental budgeting. Because resources are becoming scarcer and budget justification requirements are increasing, it is the opinion of the author that ZBB will remain in the budget arena after the present administration leaves office. Therefore, it is recommended that a workable ZBB format be included in the FMIS system for use when Phase III is implemented. Computer capabilities for easily changing rankings within decision package sets will preclude a considerable number of manual manipulations by budget analysts.

4. It is considered highly desirable that a continuing effort be made to develop a workable interface between FMIS and Integrated Disbursing and Accounting (IDA). IDA provides an invaluable source of budget execution data that can be used to supplement the FMIS data base.

5. The present target date for Phase III implementation at CINCLANTFLT is June 1980. The date set for integrating FMIS with Project 77-1 is June 1982. It is recommended that the project not be rushed to a conclusion simply to meet a milestone date. An on-going study should be undertaken to determine if the current milestone objectives remain practical. If they are not, it is considered that the integrity of FMIS is more important than simply meeting a target date. As Frederick Broosk states in The Mythical

Man-Month, "I will contend that conceptual integrity is the most important consideration in system design." [20] Hence, meeting specific dates should not be the primary goal of system development.

6. There appears to be a potential conflict concerning whether FMIS should be a word processing or an automation effort. This is a potential problem which should be resolved. The author recommends that a combination of both efforts is the best way to automate the budget. Automation (i.e., building a competent data base) is a necessity if the goal is to effectively automate the Navy budget process. Word processing is extremely useful in reducing administrative overhead in a clerical environment.

7. It is recommended that following full implementation of Phase III, further study of final FMIS implementation be conducted. Comparisons of actual implementation with the final stages of the proposed model should be made to determine if actual implementation of Phase III was accomplished in an efficient and effective manner. It is also recommended that a study be conducted of the three crucial classes of variables inherent in all management information systems. These are user attitudes and perceptions, the actual use of the system, and its performance. A study of this type could uncover and help solve potential problems that might not manifest themselves until the system was fully implemented.

8. Vertical expansion of the system is highly recommended. Though automation of the budget process at OPNAV and the major claimant level is currently in process, it is recommended that these capabilities be extended to the sub-claimants and even further to the activity level. One concept that has been introduced is the Type Commander Overhaul Budget System (TYCOBS). The objective of this system is to provide ADP support at the sub-claimant level in formulating and managing maintenance budgets. Automated efforts throughout the budget chain would greatly enhance the quality and timeliness of information needed to successfully form Navy budgets.

9. There is the potential for problems to occur when the FMIS program is integrated into increment IV of Project 77-1. It is recommended that a study be conducted to determine if any interface problems exist between the budget automation effort at NAVCOMPT and CINCLANTFLT. A study of this type should be conducted now while both systems are still being developed. Any inconsistencies between the two efforts should be resolved before the integration date of June 1982 to prevent unnecessary slippage of milestone targets.

LIST OF REFERENCES

1. Ross, Joel E., Modern Management and Information Systems, Prentice Hall, 1976.

2. Lucas, Henry C., Why Information Systems Fail, Columbia University Press, 1975.

3. Kelly, Joseph K., Computerized Management Information Systems, MacMillan Company, 1970.

4. Hartman, W., Matthes, H., and Proeme, A., Management Information Systems Handbook, McGraw-Hill, 1972.

5. Dykeman, Francis C., Financial Reporting Systems and Techniques, Prentice-Hall Inc., 1969.

6. Burk, J.D., Information Requirements of a Management Information System Relating to the Budgetary Decisions of a Coast Guard Program Manager, M.S. Thesis, Naval Postgraduate School, Monterey, Ca. 1974.

7. Bell, M.C., Budgeting and Financial Information Systems in the Marine Corps, M.B.A. Thesis, George Washington University, 1972.

8. Henderson, A.L., The Impact of Computerization on the Design of Accounting Systems in the U.S. Navy Supply System, M.B.A. Thesis, George Washington University, 1972.

9. Comptroller of the Navy UNCLASSIFIED Letter NAFC-621 5260.271 to Commander in Chief, U.S. Atlantic Fleet, Subject: Automation of the Navy Budget Process, 26 June 1978.

10. Comptroller of the Navy UNCLASSIFIED Memorandum to the Commander, Naval Data Automation Command, Subject: Submission of Project Requests 07F1036 and 07F1037, 7 March 1978.

11. Naval Postgraduate School, Practical Comptrollership Course, 1978.

12. NAVCOMPTNOTE 7111 UNCLASSIFIED Circular A-115, to the Heads of Executive Departments and Establishments, Subject: Zero-Based Budgeting, May 5, 1978.

13. Comptroller of the Navy UNCLASSIFIED Navcomptnote 7120, Subject: Procedures for the FY 1980 Department of the Navy (DON) Budget Review.

14. Commander in Chief, U.S. Atlantic Fleet, UNCLASSIFIED Serial 413, Subject: Financial Management Information System (FMIS) Phase III, Jan. 20, 1978.

15. Comptroller of the Navy, UNCLASSIFIED, IFMIS Project 77-1, Subject: Departmental Reporting System Project, Automation of the Major Claimant Budget Process at a Prototype Activity for the Operation and Maintenance, Navy (O & MN) Appropriation.

16. Commander in Chief, U.S. Atlantic Fleet, UNCLASSIFIED, CINCLANTFLT Note 7100 (N0421B), Subject: Detailed Guidance for the Preparation and Submission of the FY 80 O & MNR Zero-Base Budget; justification material, Feb. 7, 1978.

17. Office of the Comptroller, U.S. Navy, UNCLASSIFIED, NAFC-62 Serial 5260, Subject: Financial Management Improvement Program (FMIP) Departmental Reporting System, Project 77-1, and Classification System, Project 77-2, Feb. 27, 1978.

18. Commander in Chief, U.S. Atlantic Fleet, UNCLASSIFIED, CINCLANTFLT Letter 5230/FF1-2/0223D, Serial 4100, Subject: Major Claimant Budget Automation, June 21, 1978.

19. Commander in Chief, U.S. Atlantic Fleet, UNCLASSIFIED, CINCLANTFLT Letter 7000/FF1-2/NO421BA Serial 2867, Subject: Automation of Civilian Manpower Budget Exhibits, May 1, 1978.

20. Brooks, Frederick P., The Mythical Man-Month, Addison-Wesley Publishing Co., 1975.

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